

and the author states his reasons for believing that the branchial filaments are the principal absorbing organs, the materials they receive being chiefly employed in the construction of the electrical organs, while those which enter into the composition of the body generally are absorbed by the general surface of the fœtus. The author is led, from his researches, to the conclusion that the mode of reproduction in the *Torpedo* is intermediate between the viviparous and the ovoviviparous.

In the second part of the paper, the author discusses the question as to the number of species of the genus *Torpedo* existing in the Mediterranean; and concludes that there are only two, viz. the *Ochiatella* and the *Tremola*.

4. "Appendix to a former Paper on Human Osteology." By Walter Adam, M.D. Communicated by Dr. Prout, F.R.S.

This appendix contains linear representations of various dimensions of the bones of the human body, both male and female, with a view to facilitate the comparison of the human frame with that of other animals, and reduce it to definite laws. The author states that many of the rectilinear dimensions of human bones appear to be multiples of one unit, namely, the breadth of the cranium directly over the external passage of the ear; a dimension which he has found to be the most invariable in the body. No division of that dimension was found by him to measure the other dimensions so accurately as that by seven, or its multiples. Of such seventh parts there appear to be twelve in the longitudinal extent of the back, and ninety-six in the height of the whole body.

5. "On the Repulsive Power of Heat." By the Rev. Baden Powell, M.A., F.R.S., Savilian Professor of Geometry in the University of Oxford.

The expansion of bodies by heat appearing to imply a mutual repulsion of their particles, it becomes a question whether such repulsive power may not be excited by it between particles or masses of matter, at sensible as well as insensible distances. After noticing the partial investigations of this question by Libri, Fresnel, Saigey, and Professor Forbes, the author describes the methods he has employed with a view to its solution, and which consisted in applying heat to two lenses of glass, pressed together so as to exhibit the colours of thin plates; the variation of the tints furnishing exact indications of the most minute changes of distance between the surfaces, by whatever causes they may be produced. The conclusion he deduces from his experiments, conducted on this plan, is that the separation of the surfaces is of a different character, and is greater than can be accounted for by the mere change of figure produced by the heat; and is therefore in part to be ascribed to a real repulsive action between the surfaces of the glasses derived from the power of heat. He also found, on trying similar experiments with glass in contact with a metallic surface, that the results were considerably influenced by the radiating power of the latter; the effect being increased when this power was greater, and

also by all other causes tending to the more rapid communication of heat. This is still more apparent when the coloured rings are formed in a thin plate of water interposed between the lenses, and where the effects are independent of radiation.

6. "Analysis of the Moira Brine Spring near Ashby-de-la-Zouch, Leicestershire, with Researches on the Extraction of Bromine." By Andrew Ure, M.D., F.R.S.

The water derived from the spring in question is raised by means of a pump from the coal mines in the neighbourhood of Ashby-de-la-Zouch, is much used as medicinal baths, and is also administered internally, principally as a remedy for bronchocele and scrofulous tumors. The result of the analysis made by the author, is that it contains per gallon,

Bromide of sodium and magnesium	grs. 8.
Chloride of calcium	851.2
————— magnesium	16.
————— sodium	3700.5
Protoxide of iron, a trace	

Solid contents	4575.7
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After removing from the water the deliquescent chlorides of lime and magnesia by the addition of carbonate of soda, he transmits through the mother liquor, consisting of chloride and bromide of sodium, a current of chlorine gas, till it communicates the maximum golden tint, and then adds sulphuric æther, which, by agitation, carries with it to the surface the bromine and chlorine, constituting a reddish yellow stratum. The proportion in which these two elements exist in the evaporated solution may be ascertained with the greatest nicety by the addition of a solution of nitrate of silver; the method of calculation for this purpose being detailed by the author.

7. "On the Nature and Origin of the Aurora Borealis." By the Rev. George Fisher, M.A., F.R.S.

The author deduces from his own observations made during a residence of two winters in high northern latitudes, taken in conjunction with the concurring testimony of various navigators and travellers, the general fact that the Aurora Borealis is developed chiefly at the edge of the Frozen Sea, or wherever there is a vast accumulation of ice; and he conceives that it is produced in situations where the vapours of a humid atmosphere are undergoing rapid congelation. Under these circumstances, when viewed from a distance, it is seen fringing the upper border of the dark clouds, termed the "sea blink," which collect over these places; and it generally forms an arch a few degrees above the horizon, shooting out vertical columns of pale yellow light. He concludes that the Aurora Borealis is an electrical phenomenon, arising from the positive electricity of the atmosphere, developed by the rapid condensation of the vapour in the act of freezing, and the induced negative electricity of the surrounding portions of the atmosphere; and that it is the immediate consequence